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1933

## Telegraphy: Technical School Examinations 1933

Department of Education: Technical Instruction Branch

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AN ROINN OIDEACHAIS  
(Department of Education),

BRAINSE AN CHEARD-OIDEACHAIS  
(Technical Instruction Branch).

SPECIAL EXAMINATIONS FOR POST OFFICE  
EMPLOYEES.

1933.

TELEGRAPHY.

*Tuesday, May 9th—7 to 10 p.m.*

*Examiner*—J. D. FERGUSON, Esq., B.Sc. (Eng.), A.M.I.E.E.,  
M.A.I.E.E., M.I.R.E.

*Co-Examiner*—J. P. HACKETT, Esq., B.E., A.R.C.S.C.I.

GENERAL INSTRUCTIONS.

You are carefully to enter on the Answer Book and Envelope supplied your Examination Number and the subject of examination, but you are not to write your name on either. No credit will be given for any Answer Book upon which your name is written, or upon which your Examination Number is not written.

You must not have with you any book, notes, or scribbling-paper.

You are not allowed to write or make any marks upon your paper of questions.

You must not, under any circumstances whatever, speak to or communicate with another candidate; and no explanation of the subject of the examination may be asked for or given.

You must remain seated until your answer-book has been taken up, and then leave the examination-room quietly. You will not be permitted to leave before the expiration of twenty minutes from the commencement of the examination, and will not be re-admitted after having once left the room.

If you break any of these rules, or use any unfair means, you are liable to be dismissed from the examination, and your examination may be cancelled by the Department.

*Three hours are allowed for this paper. Answer-books, unless previously given up, will be collected at 10 p.m.*

(7) Draw a diagram of a C.B. simplex telegraph circuit with two out offices. What would be the effect upon the working of such a circuit if the 1,000 ohms resistance were substituted by a resistance of 40 ohms?

(8) A battery of ten cells in series sends a current of 15 milliamperes through an external resistance of 995 ohms. If the internal resistance of each cell is 0.5 ohm, calculate the e.m.f. of each cell.

(9) Discuss the use of copper versus iron wire for open telegraph lines. Describe carefully the operation of jointing a 150lb. copper conductor.

(10) Describe two methods of terminating a lead-covered paper-core underground cable on a terminal pole. Which method do you consider the better, and why?

(11) Shunts are used on detectors No. 2, differential galvanometers and sounders. Explain the use of the shunt in each case.

(12) Explain the following terms used in connection with secondary cells:—

- (a) Ampere-hour capacity.
- (b) Specific gravity.
- (c) Hydrometer test.
- (d) Topping up.
- (e) Sulphating.

# INSTRUCTIONS.

*Read the General Instructions on Page 1.*

(a) EIGHT questions only may be attempted. Where feasible, answers must be illustrated by simple sketches.

(b) Equal values are attached to the questions.

(c) Answers must be written in INK; diagrams may be drawn in PENCIL.

(d) Write the number of the question distinctly, in the margin of the paper, before the answer.

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(1) Explain the principle of double current duplex working. Describe carefully the operation of obtaining a resistance balance on such a circuit.

(2) Three types of sounder are in general use, the polarised sounder, the local battery sounder and the sounder for use with secondary cells. Explain the essential differences in these types of sounder.

(3) What tests would you make on a differential galvanometer to prove that it was in good working order for use on a duplex circuit?

(4) Explain the following terms used in technical telegraphy:—

- (a) "Non-polarised" as applied to a relay.
- (b) "Reversed signals."
- (c) "Out of balance" as applied to a duplex circuit.
- (d) "Giving R" as applied to a duplex circuit.

(5) Give a brief description of a main distribution frame as used at a large telegraph office, and explain the object of each component of the frame.

(6) Describe the provision made on a telegraph test board for testing lines for contacts, earth faults and disconnections, and explain how two lines are tested to determine if they are in contact.